Equation of a line

1. Find the equation of the line through the point (2,-5) which is parallel to the line with equation $4x + 2y = 10$.

2. A line has equation $2x – 3y – 1 = 0$. Find the equation of the line perpendicular to this line which passes through the point (-1,5).

3. Find the equation of the line passing through the point C(2,3) which is perpendicular to the line passing through the points A(1,3) and B(7,1).

4. Write down the equation of the line joining each pair of points below.

   (a) (2,5) and (2,-6) (b) (-3,-5) and (6,-5) (c) (-1,4) and (6,4)

5. P is the point ((2,7), Q is (3,3) and R is (11,5).
   Show that triangle PQR is right-angled at Q.

6. The point A has coordinates (7,4). The straight lines with equations $x + 3y = -1$ and $2x + 5y = 0$ intersect at B.

   (a) Find the coordinates of the point B.
   (b) Find the gradient of the line AB.
   (c) Hence show that AB is perpendicular to one of these lines.

7. A triangle ABC has vertices A(2,1), B(8,7) and C(3,-6). Find the equation of the median from C to AB.

8. A triangle PQR has vertices P(-1,4), Q(4,6) and R (9,-2). Find the equation of the median from Q.

9. A triangle KLM has vertices K(-6,-3), L(-2,2) and M(5,-5). Find the equation of the altitude from K.

10. A triangle EFG has vertices E(-6,-4), F(0,5) and G(3,1). Find the equation of the altitude from E.

11. A triangle PQR has vertices P(4,-3), Q(-6,-5) and R(-4,5).
    The median RE and the altitude QD intersect at J.

    (a) Find the equations of RE and QD.
    (b) Find the coordinates of J.

12. A rhombus PQRS has diagonals PR and QS.
    PR has equation $y = 2x – 6$. Q has coordinates (7,-2).

    (a) Find the equation of the diagonal QS.
    (b) Find the coordinates of T, the intersection of PR and QS.
    (c) R is the point (-2,-10). Write down the coordinates of P.